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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,053	06/21/2001	Eiichi Sugihara	NAK-007	3627

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EXAMINER
KUHNS, ALLAN R

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/885,053	SUGIHARA ET AL.
Examiner	**Group Art Unit**
KUHNS	1732

—The MAILING DATE of this communication appears on th cover sheet beneath th correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-2, 7-14 AND 17-31 is/are pending in the application.

Of the above claim(s) 7-14 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-2 AND 17-31 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☒ Claim(s) 1-2, 7-14 AND 17-31 are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Atta hment(s)

☒ Information Disclosure Stat ment(s), PTO-1449, Paper No(s). 4, 7

☐ Int rview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Revi w, PTO-948

☐ Oth r _____

Office Action Summary

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-2 and 17-31, drawn to an injection foaming process, classified in class 264, subclass 51.

II. Claims 7-9, drawn to an injection molding machine, classified in class 425, subclass 4R.

III. Claims 10-14, drawn to a resin composition, classified in class 516, subclass 11.

2. The inventions are distinct, each from the other because:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as one in which a colorant, rather than a physical foaming agent, is introduced into the screw within a cylinder at the location of the feeding part.

Inventions I and III are related as product (composition) and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product (composition) as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the process as claimed can be

practiced with another materially different composition such as one having filler material with an average particle size lying outside the range of claim 10.

Inventions II and III are related as composition and apparatus using that composition. These inventions are distinct because the composition as claimed can be used in a materially different apparatus such as one having a die which releases the composition directly to the atmosphere (ambient) rather than to an injection mold.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art requiring divergent fields of search for the respective inventions, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Robert Mukai on September 22, 2003 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-2 and 17-31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. It appears that "of" on line 2 of claim 23 should be "or".

6. Claims 1-2 and 17-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is indefinite because the end point of the range of clause (2) is defined in a confusing manner. In particular, "to a length nine times the outside diameter of the screw in the direction of injection" is confusing because it does not specify the

point from which the "nine times the outside diameter of the screw" is measured. Perhaps only the phrase "measured from the starting point of the second stage" after "screw" on line 3 of clause (2) is absent. Also, insertion of "to the cylinder" after "foaming agent" on line 1 of clause (2) would clarify the claim. Some clarification is required.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-2, 19, 21, 23 and 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers. Rogers discloses the basic claimed process for injection-foaming a plastic resin using an injection molding machine having a compression screw within a cylinder and to which a physical foaming agent is fed at a midpoint of the cylinder (it is submitted that the process of Rogers includes two stages, one involving the kneading of the polymer alone and the other involving kneading the polymer together with the foaming agent), including (1) feeding the physical foaming agent into the cylinder from a storage tank or source 19, (2) feeding the foaming agent to the cylinder within a range from the starting point of the second stage of the screw to a length nine times the outside diameter of the screw in the direction of injection (note openings 26 disclosed by Rogers for feeding of the foaming agent) at the time the screw is advanced most forward in the direction of injection (The screw of Rogers appears to be stationary so it's always at a most forward position. Note further that it is well known to

introduce a foamable mixture into a mold by reciprocating movement of a screw as taught at column 7, lines 14-40 of Xu (6,322,347), now cited of interest), and (3) obtaining a foam by reducing the pressure in the cavity of a mold, injecting resin into the cavity and then expanding the volume of the cavity. Rogers appears not to state that the pressure at the cylinder is lower than the pressure at the source or storage area, but maintaining such a pressure difference is well known and would have been obvious to one of ordinary skill in the art in order to cause the foaming agent to flow in a desired manner.

Rogers discloses expanding the volume of the mold cavity by retracting plate 24, as in claim 2. Rogers suggests a supercritical condition, as in claim 19, given the pressure range specified at column 2, line 62 and known critical points of foaming agents which Rogers intends to use. Relative pressures between source and cylinder, as in claim 19, would have been readily determined through routine experimentation by one of ordinary skill in the art in order to produce desired flow conditions. It is submitted that valve 31 of Rogers acts as a check valve, as in claim 21. The disclosure at column 1, lines 27-29 indicates that it is well known and conventional to use carbon dioxide as a foaming agent, as in claim 23. The ingredients of claims 25-28 are well known in foamable compositions and their use in the method of Rogers would have been obvious to one of ordinary skill in the art in order to cause expansion. Rogers teaches that conventional polymers are suitable for use in his process, and it is submitted that polyolefins, as in claim 29, are a notorious example of a conventional polymer. Rogers suggests setting the volume of the mold cavity at an initial volume less than the quantity or volume of the resin being injected, as in

claims 30-31, at column 3, lines 60-64 by discussing the moving of wall structure 24 to accommodate the plastic.

9. Claims 17-18, 20, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers as applied to claims 1-2, 19, 21, 23 and 25-31 above, and further in view of Kim et al. Kim et al. illustrate an extruder screw having relative screw depths within the ranges of claims 17-18. Note the structure of illustrated by Figure 6, for example. It would have been obvious to one of ordinary skill in the art to include such a structure in the system of Rogers in order to permit adequate mixing of the foaming agent with the polymer. It is submitted that prior comments concerning claims 19, 21 and 23 are also applicable to claims 20, 22 and 24.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Kuhns whose telephone number is (703) 308-3462. The examiner can normally be reached on Monday to Thursday from 7:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni, can be reached on (703) 305-5493. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Allan R. Kuhns

ALLAN R. KUHNS
PRIMARY EXAMINER AU 1732
9-25-03